

WHAT IS CLAIMED IS:

1. A method for providing images for an operator of a vehicle, comprising:

5 receiving electrical signals representing electromagnetic radiation at an image source;

generating a visual image based on the electrical signals; and

10 reflecting different portions of the visual image with a magnifying optical element for presentation at different viewing locations, the visual image appearing as a virtual image;

15 wherein at least one dimension of the visual image is larger than the magnifying optical element can use to present an image at one of the viewing locations.

2. The method of Claim 1, wherein the dimension comprises the vertical.

20 3. The method of Claim 1, wherein the vertical field-of-view of the virtual image is at least one degree larger than the vertical field-of-view at the viewing location.

25 4. The method of Claim 1, wherein the magnifying optical element comprises an aspheric magnifying reflector.

5. The method of Claim 1, further comprising reflecting the visual image with a mirror before the visual image encounters the magnifying optical element.

5 6. The method of Claim 1, further comprising reflecting the visual image with the windshield for presentation at the viewing locations.

10 7. The method of Claim 1, further comprising: receiving electromagnetic radiation; and generating the electrical signals that represent the electromagnetic radiation.

15 8. The method of Claim 1, wherein the electrical signals received at the image source represent infrared radiation from a field-of-view in front of the vehicle.

20 9. The method of Claim 1, wherein the dimension of the visual image is larger than the magnifying optical element can use to present an image at a substantial portion of the viewing locations in an eye ellipse.

25 10. The method of Claim 9, wherein the portion is greater than approximately ninety-five percent of the eye ellipse.

11. A method for providing images for an operator of a vehicle, comprising:

receiving electrical signals representing electromagnetic radiation at an image source;

5 generating a visual image based on the electrical signals; and

reflecting different portions of the visual image with a magnifying optical element for presentation at different viewing locations, the visual image appearing 10 as a virtual image;

wherein the total field-of-view of at least one dimension of the virtual image is larger than the field-of-view that the magnifying optical element can present in that dimension at one of the viewing locations.

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12. The method of Claim 11, wherein the dimension comprises the vertical.

13. The method of Claim 12, wherein the total 20 vertical field-of-view of the virtual image is at least one degree larger than the vertical field-of-view that the magnifying optical element can present at the viewing location.

25 14. The method of Claim 11, wherein the magnifying optical element comprises an aspheric magnifying reflector.

15. The method of Claim 11, further comprising reflecting the visual image with the windshield for presentation at the viewing location.

5 16. The method of Claim 11, wherein the total  
field-of-view of at least one dimension the virtual image  
is larger than the field-of-view that the magnifying  
optical element can present at a substantial portion of  
the viewing locations in an eye ellipse.

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17. The method of Claim 11, wherein the portion of the eye ellipse is greater than approximately ninety-five percent of the eye ellipse.

18. A system for providing images for an operator of a vehicle, comprising:

an image source operable to receive electrical signals representing electromagnetic radiation and  
5 generate a visual image based on the electrical signals; and

10 a magnifying optical element operable to reflect different portions of the visual image for presentation at different viewing locations, the visual image appearing as a virtual image;

wherein at least one dimension of the visual image is larger than the magnifying optical element can use to present an image at one of the viewing locations.

15 19. The system of Claim 18, wherein the dimension comprises the vertical.

20. The system of Claim 18, wherein the vertical field-of-view of the virtual image is at least one degree  
20 larger than the vertical field-of-view at the viewing location.

21. The system of Claim 18, wherein the magnifying optical element comprises an aspheric magnifying  
25 reflector.

22. The system of Claim 18, further comprising a mirror positioned to reflect the visual image before it encounters the magnifying optical element.

23. The system of Claim 18, further comprising the windshield of the vehicle, the windshield reflecting the visual image for presentation at the viewing locations.

5 24. The system of Claim 18, further comprising a radiation collector operable to receive electromagnetic radiation and generate the electrical signals that represent the electromagnetic radiation, the radiation collector coupled to the image source.

10 25. The system of Claim 18, wherein the electrical signals received at the image source represent infrared radiation from a field-of-view in front of the vehicle.

15 26. The system of Claim 18, wherein the dimension of the visual image is larger than the magnifying optical element can use to present an image at a substantial portion of the viewing locations in an eye ellipse.

20 27. The system of Claim 26, wherein the portion is greater than approximately ninety-five percent of the eye ellipse.

28. A system for providing images for an operator of a vehicle, comprising:

an image source operable to receive electrical signals representing infrared radiation and generate a  
5 visual image based on the electrical signals;

a fold mirror positioned to reflect the visual image; and

10 an aspheric magnifying reflector positioned to reflect different portions of the visual image for presentation at different viewing locations, the visual image appearing as a virtual image;

15 wherein the vertical dimension of the visual image is larger than the aspheric magnifying mirror can use to present an image at a substantial portion of the viewing locations in an eye ellipse.

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